RHODE ISLAND DEPARTMENT OF HEALTH
CENTER FOR DRINKING WATER QUALITY

WELL DISINFECTION PROCEDURE

Follow the procedures below and save this completed checklist for reference during compliance inspections. Please read all of the steps before you begin.

Date: _____

Reason for well disinfection: _____

1. Shut off all power to well to avoid potential electrical shock. Ensure that power switches will not be inadvertently turned on. (Please refer to OSHA 29 CFR 1910.147 “lock out, tag out” procedure). Power should not be turned back on until Step 5, after the chlorine solution has been placed in the well.

   ☐ **Power shut off and secured**

2. Refer to the attached Well Disinfection Calculators (5.25% or 8.25% available chlorine) to determine the appropriate amount of unscented liquid household bleach to introduce to the well. **DO NOT USE BLEACH SOLIDS,TABLETS, OR PELLETS**. Note: For large storage tanks, additional disinfection requirements may be necessary to achieve the desired effect. Refer to AWWA Standard C652 for guidance when disinfecting large storage tanks.

   ☐ **Type and amount of bleach used:** _____

3. Fill a clean 5-gallon bucket approximately halfway with clean water. Slowly pour the appropriate amount of bleach for your system into half-full bucket and then carefully fill remainder with clean water. Wear appropriate personal protective equipment, including but not limited to gloves and eyewear.

4. If the well cap has the discharge pipe coming out the top of the well, well disinfection should be performed by a well professional. If the well cap is a “pitless adapter” type (the discharge pipe is underground), remove well cover/cap by removing the bolts or loosening the set screws, but be careful not to drop parts into the well. Remove any visible insects or debris found within the wellhead.

   ☐ **Well cover/cap and opening inspected for insects and debris.**

   Notes: _____

5. Pour bleach and water solution into well making sure to cover all surfaces within the wellhead and interior of the casing. Turn on the power to the pump. Spray or hose down the interior of the well with chlorinated water by attaching a hose to the nearest tap downstream, prior to any unpressurized storage reservoirs (if this is not possible, contact DWQ or a water system maintenance professional for further technical consultation). Recirculate water from the tap back into the well for approximately 15 minutes. Use caution to avoid electrical wires when applying solution to prevent corrosion of wire sheathing.

   ☐ **Solution introduced as noted above.**

   Notes: _____

6. Turn off the power to the pump. Remove the hose and ensure the well cover/cap is properly secured. Turn power back on to pump. To disinfect the distribution system in addition to the well, operate the well pump until the entire distribution/piping system is full of chlorinated water from within the well. **To ensure that all potential sources of contamination are disinfected, supply chlorinated water to each plumbing fixture/faucet (cold and hot faucets, showers, outdoor spigots, etc.) until you detect an odor of chlorine in each fixture.**

   ☐ **Well cover/cap secured** ☐ **Procedures completed as above**

   Notes: _____

7. Allow the chlorinated water to remain in the well and piping system (if disinfecting the distribution system as well) overnight (minimum of 8 hours).

   ☐ **Completed** **Notes:** _____

8. Pump the well water to waste (discharge water from outdoor faucet using hose to the ground surface AWAY from well(s), any surface water system, storm water system, garden, lawns, etc.) until no chlorine is left in the water. Next, discharge the small amount of chlorinated water left in the distribution system (water lines, faucets, other fixtures, etc.) down the appropriate drain(s) until no chlorine is left in the water. Water within plumbing fixtures must NOT be used for consumptive purposes until no chlorine is left in the water.

   Use EPA-approved chlorine test strips or test kit to confirm chlorine is no longer in the discharge water from the well or distribution system.

   Note: Highly chlorinated water can disrupt microbial activity within septic systems and affect waste decomposition processes. A large volume of water can be found in deep wells. Therefore, the highly chlorinated discharge water from the well should not be discharged into septic systems. If you have questions regarding disposal of chlorinated water into a septic system, contact RIDEM's OWTS Program for more information. Chlorinated water should not be discharged to surface water or a storm water system. If either are nearby, contact RIDEM's RIPDES Program to obtain discharge requirements.

   ☐ **Completed** **Notes:** _____

9. After allowing time for conditions to stabilize, and ensuring a zero-chlorine residual, collect the number of coliform samples required by RIDOH or arrange for sample collection with RIDOH or a commercial laboratory licensed by the State of Rhode Island for water testing to ensure the disinfection procedure was successful.

   ☐ **Completed** **Notes:** _____

Warning: Bleach used in this disinfection process must be flushed thoroughly from all service lines. This procedure is for shock disinfection only and should not to be used on a regular basis. Bleach contains chlorine and is harmful to organisms living in water and soil. Human exposure to strong bleach solutions (over 4 ppm chlorine) may cause severe irritation to eyes and skin. Bleach solutions over 4 ppm chlorine can be harmful if swallowed. Please use appropriate protection and precautions when handling bleach and notify customers who may be receiving highly chlorinated water before the system is flushed. For additional assistance, contact the Center for Drinking Water Quality at 401-222-6867.

For more detailed guidance, refer to Minnesota Department of Health's Well Disinfection webpage https://www.health.state.mn.us/communities/environment/water/wells/waterquality/disinfection.html.

Well Disinfection Calculator

Desired final ppm (mg/L) of free chlorine 50
Concentration of chlorine bleach 0.0525

Ounces of 5.25 % Chlorine Bleach to achieve 50 ppm

Depth o f Well in Feet	Diameter of Well in Inches												
	4	**6**	**8**	**10**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**42**	**48**
5	0.4	1	2	2	4	6	10	14	19	25	32	44	57
10	1	2	3	5	7	13	20	29	39	51	64	88	115
15	1	3	5	7	11	19	30	43	58	76	97	132	172
20	2	4	6	10	14	25	40	57					
30	2	5	10	15	21	38	60	86					
40	3	7	13	20	29	51	80	115					
60	5	11	19	30	43	76							
80	6	14	25	40	57	102							
100	8	18	32	50	72	127							
150	12	27	48	75	107	191							

Conversion:
1 gal = 128 ounces
1 quart = 32 ounces
1 pint = 16 ounces
1 cup = 8 ounces

For a deeper well, sum the ounces as appropriate (e.g. for 6" diam 200' well, 18 oz + 18 oz = 36 oz)

Well Disinfection Calculator

Desired final ppm (mg/L) of free chlorine 50
Concentration of chlorine bleach 0.0825

Ounces of 8.25 % Chlorine Bleach to achieve 50 ppm

Diameter of Well in Inches

Depth o f Well in Feet	4	6	8	10	12	16	20	24	28	32	36	42	48
5	0.3	1	1	2	2	4	6	9	12	16	21	28	36
10	1	1	2	3	5	8	13	18	25	32	41	56	73
15	1	2	3	5	7	12	19	27	37	49	62	84	109
20	1	2	4	6	9	16	25	36					
30	2	3	6	9	14	24	38	55					
40	2	5	8	13	18	32	51	73					
60	3	7	12	19	27	49							
80	4	9	16	25	36	65							
100	5	11	20	32	46	81							
150	8	17	30	47	68	122							

Conversion:
1 gal = 128 ounces
1 quart = 32 ounces
1 pint = 16 ounces
1 cup = 8 ounces

For a deeper well, sum the ounces as appropriate (e.g. for 6" diam 200' well, 11 oz + 11 oz = 22 oz)